Pike Hill Copper Mine Superfund Site Information Update - July 2022

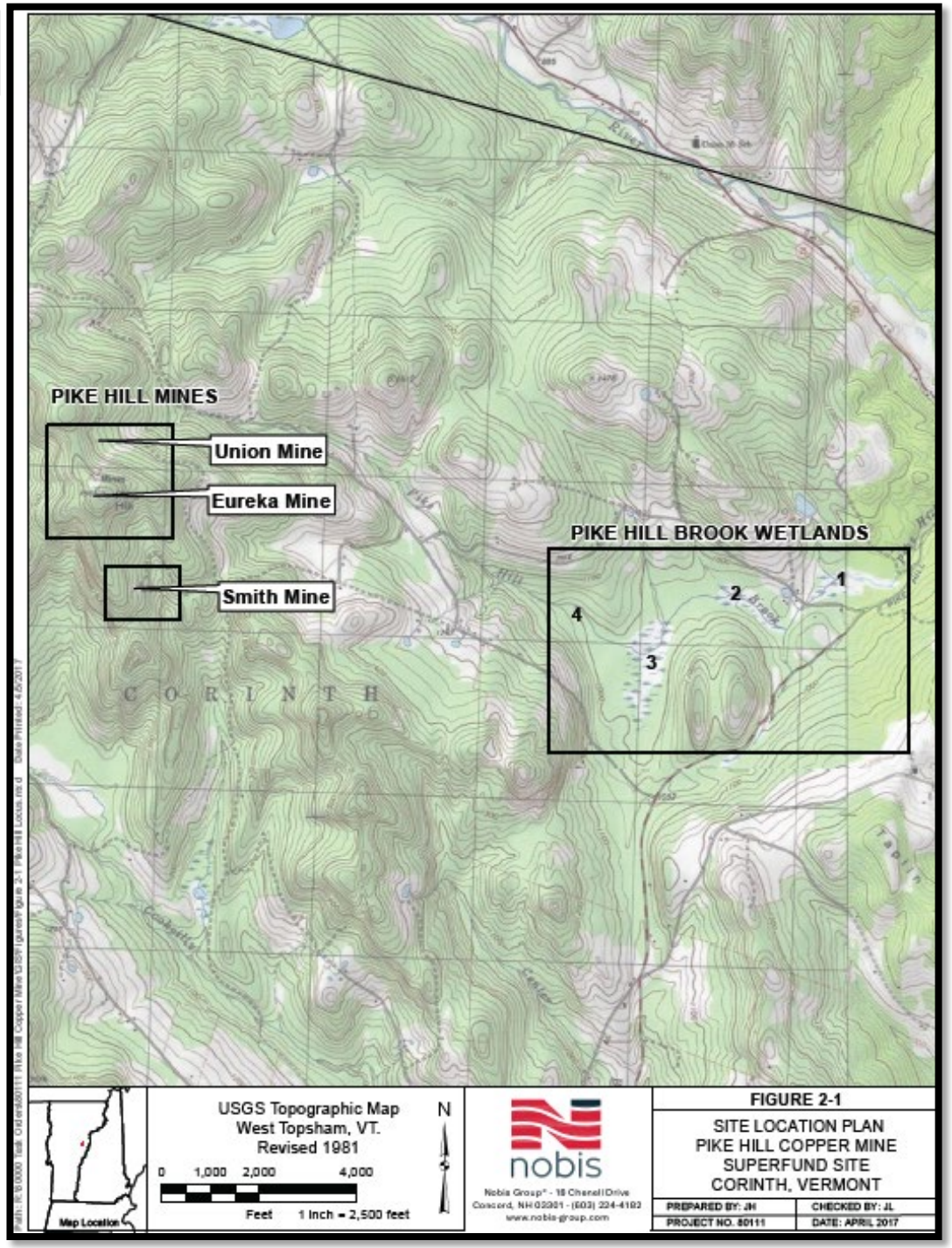
Pike Hill Copper Mine - Introduction

- The Pike Hill Copper Mine Superfund Site (Site) was placed on the EPA National Priorities List (NPL), also known as the Superfund list, in 2004

- The Pike Hill Copper Mine Superfund Site includes three separate mines along with the impacted areas of Pike Hill Brook and a tributary to Cookville Brook including downstream wetland areas.

- The Site is considered eligible for the National Register of Historic Places triggering the requirements of the National Historic Preservation Act.
  - Mining activities from 1846-1919.
  - Material brought to Elizabeth Mine in 1940s and 1950s.

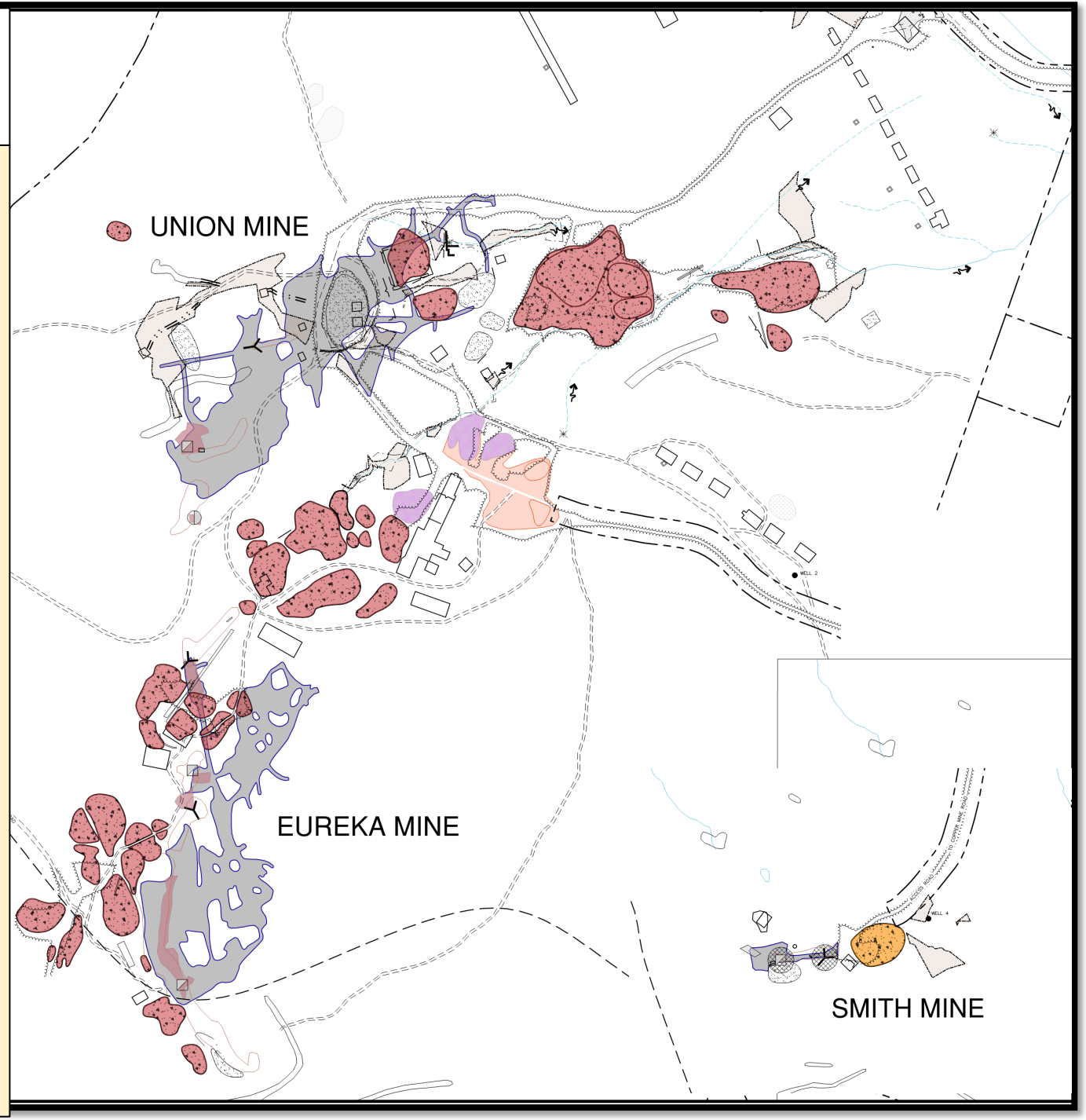
- The Site hosts the largest known concentration of state-threatened eastern small-footed bats in Vermont and is historic habitat for the federally threatened northern long-eared bat.

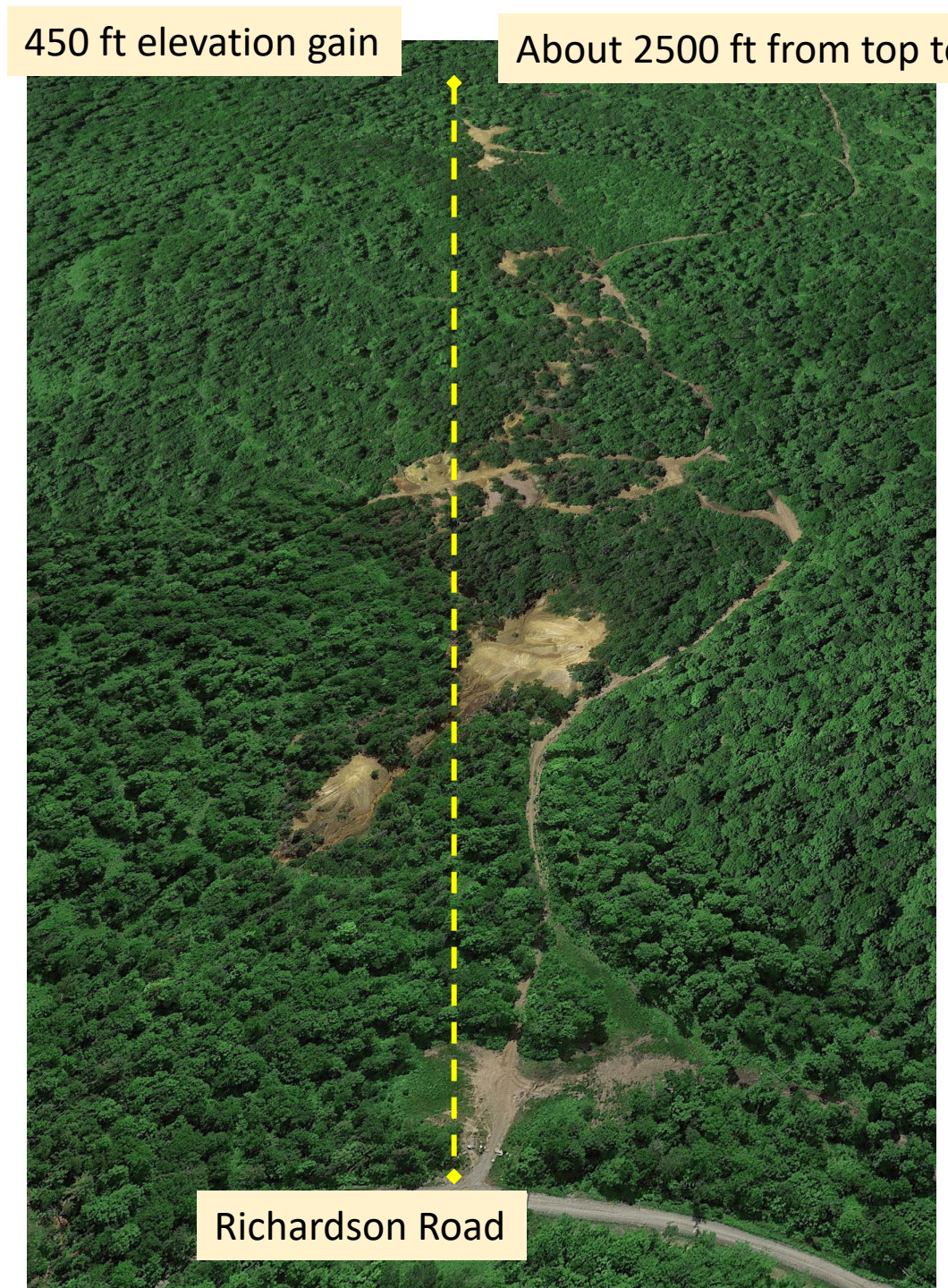


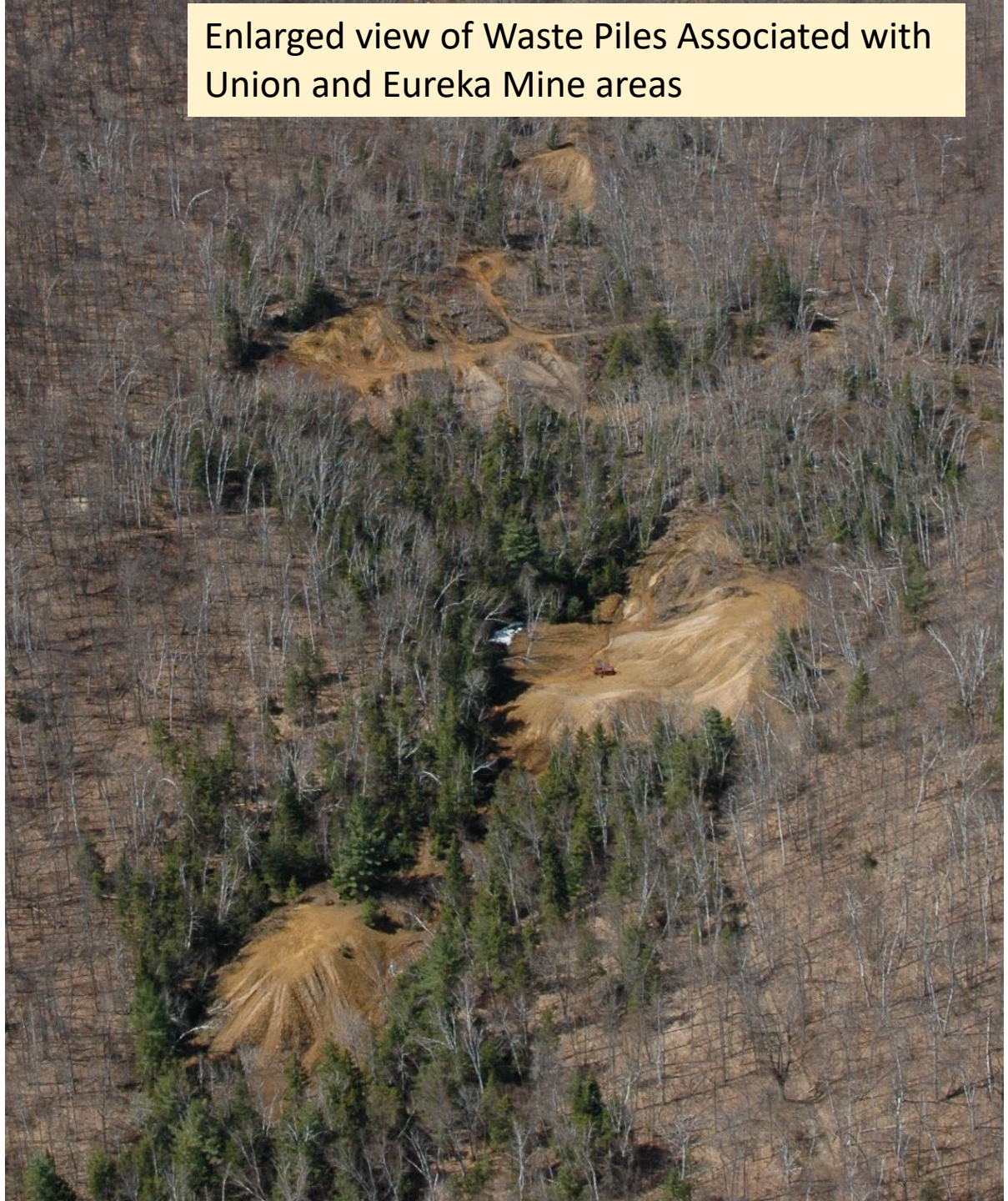
Pike Hill Copper Mine Superfund Site
Site Description

The Pike Hill Copper Mine Superfund Site contains three sub-areas.

- Eureka Mine and Union Mine:
  - Drain to Pike Hill Brook watershed.
  - About 81,000 cubic yards of mine waste material extending over about 13 acres.
  - Underground workings (shafts and adits) and old foundations.
  - The section of Pike Hill Brook immediately downstream of the waste rock piles contains mine waste.
- Smith Mine:
  - Drains to a tributary of Cookville Brook.
  - About 0.5 miles south of the other mines.
  - There are three small waste piles over about 1 acre containing about 4,000 cubic yards of waste material.
  - Underground workings (shaft and adit).

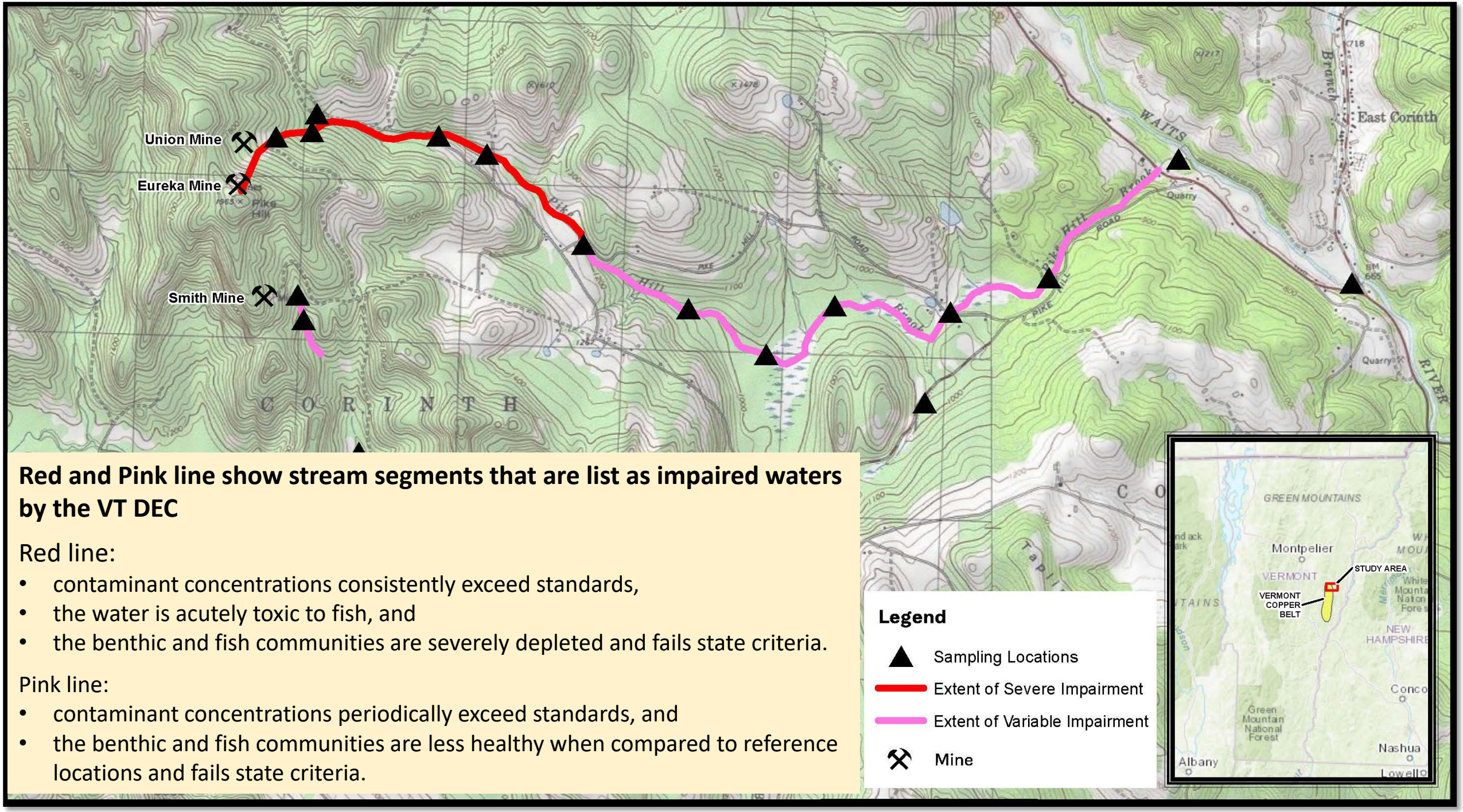



450 ft elevation gain
About 2500 ft from top to road
Richardson Road


Enlarged view of Waste Piles Associated with Union and Eureka Mine areas

Pike Hill Brook below waste piles

Tailings Piles below Eureka Mine



Red and Pink line show stream segments that are list as impaired waters by the VT DEC

Red line:

- contaminant concentrations consistently exceed standards,
- the water is acutely toxic to fish, and
- the benthic and fish communities are severely depleted and fails state criteria.

Pink line:

- contaminant concentrations periodically exceed standards, and
- the benthic and fish communities are less healthy when compared to reference locations and fails state criteria.

Pike Hill Copper Mine Superfund Site– Cleanup Objectives

- EPA is developing an Engineering Evaluation and Cost Analysis (EE/CA) to identify cleanup actions to address the impacts to Pike Hill Brook and a tributary of Cookville Brook.

- The objectives of the cleanup are listed below (updated since June presentation):

  - Control/reduce the release of MIW from mine waste to improve the composition and density of the aquatic community and reduce toxicity to the biota in Pike Hill Brook, the tributary to Cookville Brook, and associated wetlands.

  - Control/reduce the release of MIW from mine waste to reduce the loading of copper into Pike Hill Brook and the tributary to Cookville Brook and to lessen the area exceeding surface water quality standards.

  - Control the erosion of mine waste into Pike Hill Brook to reduce the transport of contaminants into Pike Hill Brook, reduce toxicity to biota, and improve the composition and density of the aquatic community in Pike Hill Brook.

  - Implement the response action in a manner that will minimize, to the extent practicable, impacts to federal and state threatened and endangered bats.

  - Implement the response action in a manner that will minimize, to the extent practicable, impacts to historic resources at the Site.

Pike Hill Copper Mine Superfund Site – Cleanup Alternatives

To accomplish the Removal Action Objectives, the EE/CA will evaluate two options:

- Alternative 1: Excavation and on-site consolidation/capping of mine waste in one or more containment cells, with in-place (referred to as "in-situ") stabilization of select areas of mine waste.

- Alternative 2: Excavation and off-site disposal of mine waste with in-situ stabilization of select areas of mine waste.

- Both alternatives would require some degree of long-term inspections and maintenance, known as Post-Removal Site Control.

Pike Hill Copper Mine Superfund Site – Cleanup Alternatives

Activities that are included in both Alternative 1 and Alternative 2:

- Survey and layout.
- Historic resource documentation and data recovery.
- Clearing, staging areas and erosion controls/stormwater management features.
- On-site access road construction (1.5 miles of on-site roads to widen and stabilize).
- Off-site (Town Road) improvements (safety improvements for 2 miles of narrow town roads).
- Excavation of approximately 65,000 cubic yards of mine waste.
- In-situ stabilization of mine waste in close proximity to the bat habitat (adding organic and alkalinity to buried waste material)
- Confirmation soil sampling.
- Restoration of areas disturbed by the cleanup, including wetland creation and the restoration of the segment of Pike Hill Brook that will be excavated.

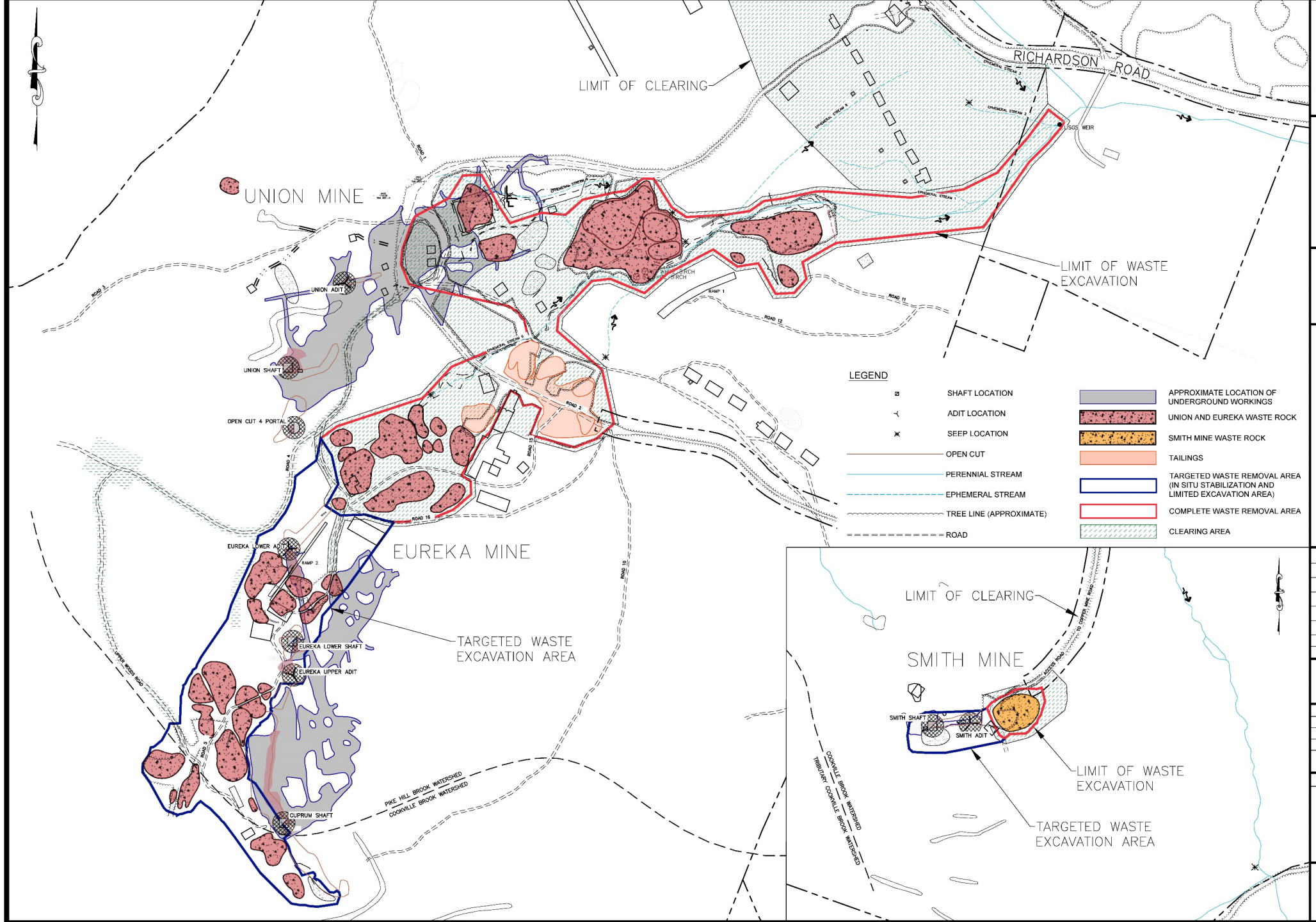
Alternative 1: Excavation and on-site consolidation/capping of mine waste with in-situ stabilization of select areas of mine waste

Activities that are unique to Alternative 1:

- Installation of cover system over the containment cell (about 3-4 acres).
  - Bedding layer
  - Geomembrane
  - Drainage net
  - Protective soil or stone layer
  - Topsoil, is soil cover
- 2-3 years for implementation.
- An estimated 5,000 truck loads would be necessary to implement Alternative 1.
- $18 million.

Alternative 2: Excavation and off-site disposal of mine waste with in-situ stabilization of select areas of mine waste

- Activities that are unique to Alternative 2:
- Transportation of 65,000 cubic yards of mines waste to an off-site disposal facility.
- 2-3 years for implementation.
- An estimated 6,700 truck loads would be necessary to implement Alternative 2.
- $28 million



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CONCEPTUAL EE/CA DRAWINGS

PIKE HILL COPPER MINE

SUPERFUND SITE
CORINTH, VERMONT

NO.	DATE	DESCRIPTION

REVISIONS

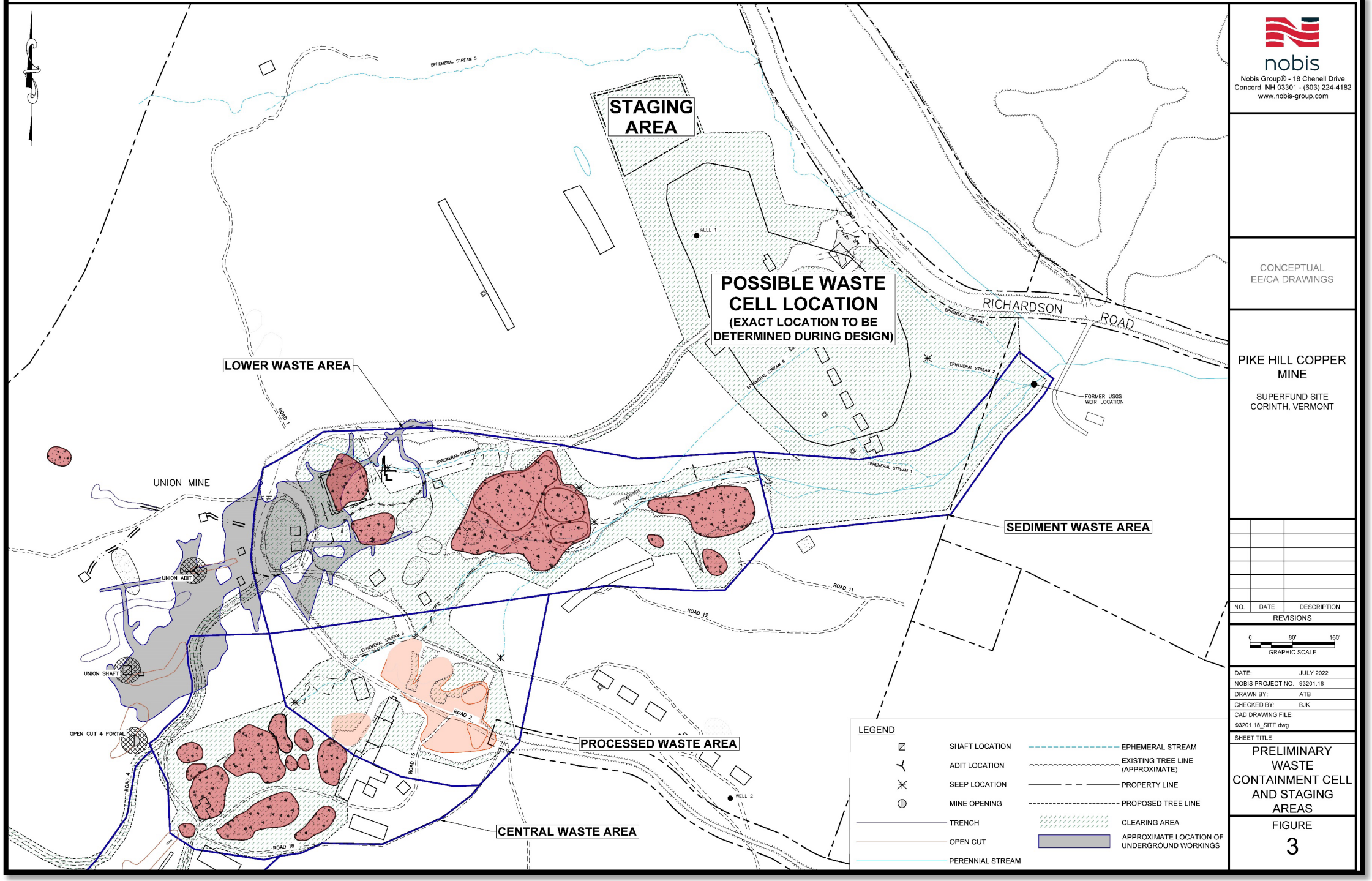
0 100' 200'
GRAPHIC SCALE

DATE:	JULY 2022
NOBIS PROJECT NO.	93201.18
DRAWN BY:	ATB
CHECKED BY:	BJK
CAD DRAWING FILE:	93201.18_SITE.dwg

SHEET TITLE

WASTE EXCAVATION AND CLEARING AREAS

FIGURE
2



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CONCEPTUAL EE/CA DRAWINGS

PIKE HILL COPPER MINE

SUPERFUND SITE
CORINTH, VERMONT

NO.	DATE	DESCRIPTION

REVISIONS

0 80' 160'
GRAPHIC SCALE

DATE:	JULY 2022
NOBIS PROJECT NO.	93201.18
DRAWN BY:	ATB
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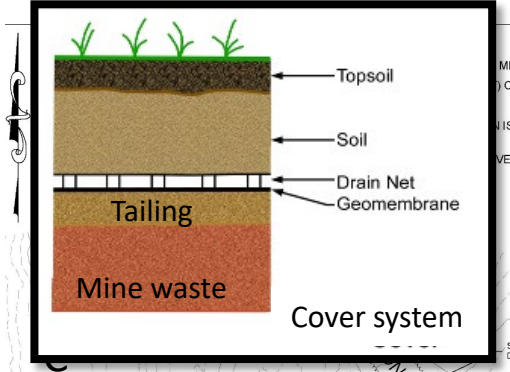
CAD DRAWING FILE:	93201.18_SITE.dwg

SHEET TITLE

PRELIMINARY WASTE CONTAINMENT CELL AND STAGING AREAS

FIGURE
3



MINIMUM SLOPE OF BENCH AREAS AND TOP OF SLOPE SHALL BE 5%.
) OF AIR SPACE (FOR WASTE).
N IS CONCEPTUAL FOR PLANNING PURPOSES ONLY. THIS CELL HAS NOT
VEY PERFORMED BY DOUCET SURVEY INC. IN SUMMER 2017 AND VCGI

PLAN LEGEND:
EXISTING GRADE CONTOUR - MAJOR
TOP OF WASTE CONTOUR - MAJOR
TOP OF WASTE CONTOUR - MINOR
LIMIT OF WASTE
EXISTING TREE LINE (APPROXIMATE)
PROPOSED TREE LINE
MIXED EROSION CONTROL BERM
CHAIN-LINK FENCE
SURFACE WATER DIVERSION SWALE
COVER SYSTEM DRAINAGE
SPOT GRADE
GRAPHIC SCALE

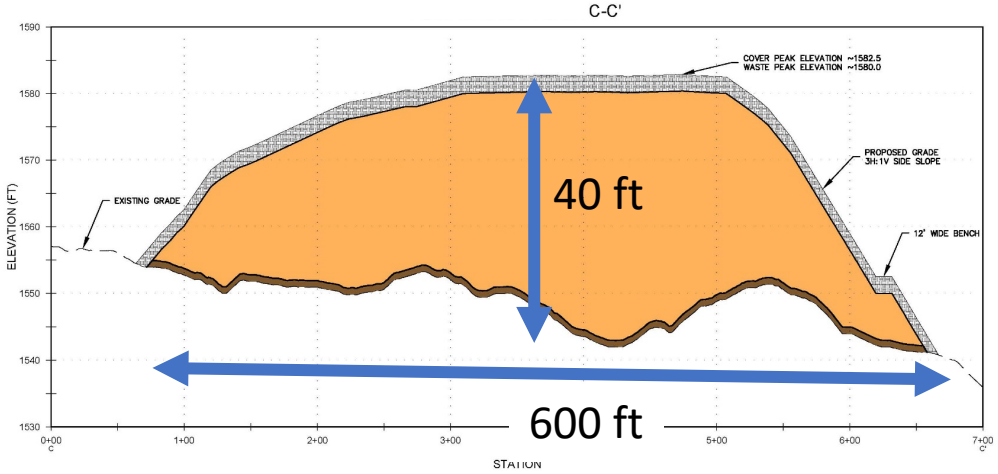
STONE-LINED SURFACE WATER DIVERSION SWALE (TYP.)
LIMIT OF CELL A MINIMUM OF 50' FROM RICHARDSON ROAD
GRAVEL PARKING AREA
ROAD
12" TALL MIXED EROSION CONTROL BERM AT LIMIT OF WORK (TYP.)
15' WIDE GRAVEL ACCESS ROAD
COVER SYSTEM DRAINAGE (TYP.)
TEMPORARY SEDIMENT BASIN (TYP.)
REFER TO SHEET C-214 FOR RESTORATION PLANS IN THE SEDIMENT AREA
A
A'
B
B'
C'

PROFILE LEGEND:
EXISTING GRADE
PROPOSED GRADE (TOP OF WASTE)
NON-WOVEN GEOTEXTILE SEPARATION LAYER
COVER SYSTEM
WASTE FILL AREA
CRUSHED STONE LAYER
HORIZONTAL SCALE IN FEET
VERTICAL SCALE IN FEET

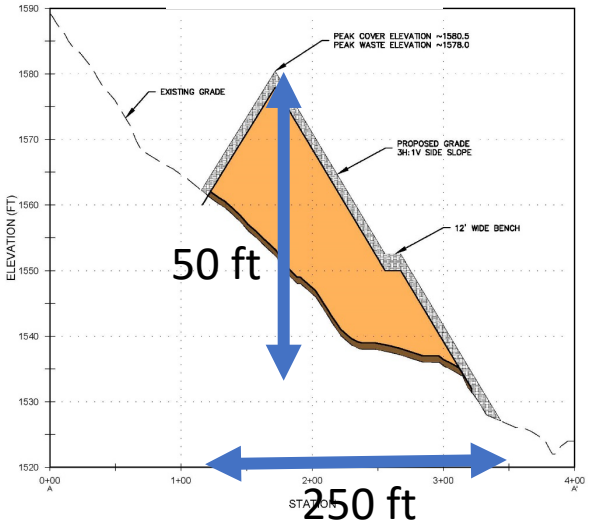
Waste Cell

- 67,000 cubic yards of waste
- 3 -acre surface area for cover
- Geomembrane cover
  - Soil or stone on top of geomembrane

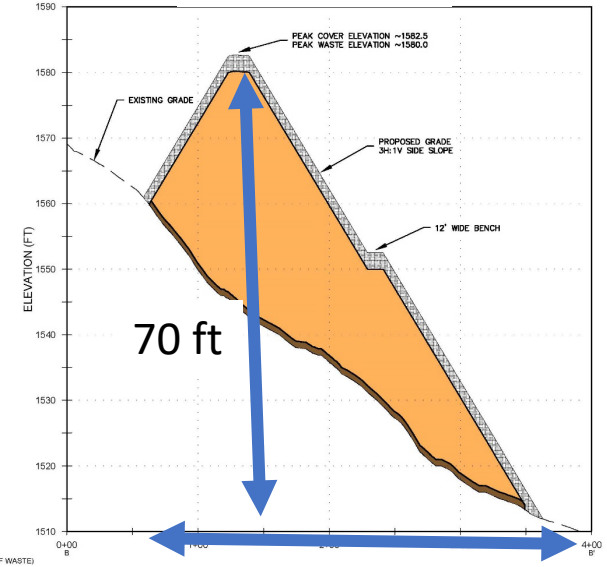
Section C-C'



Section A-A'



Section B-B'

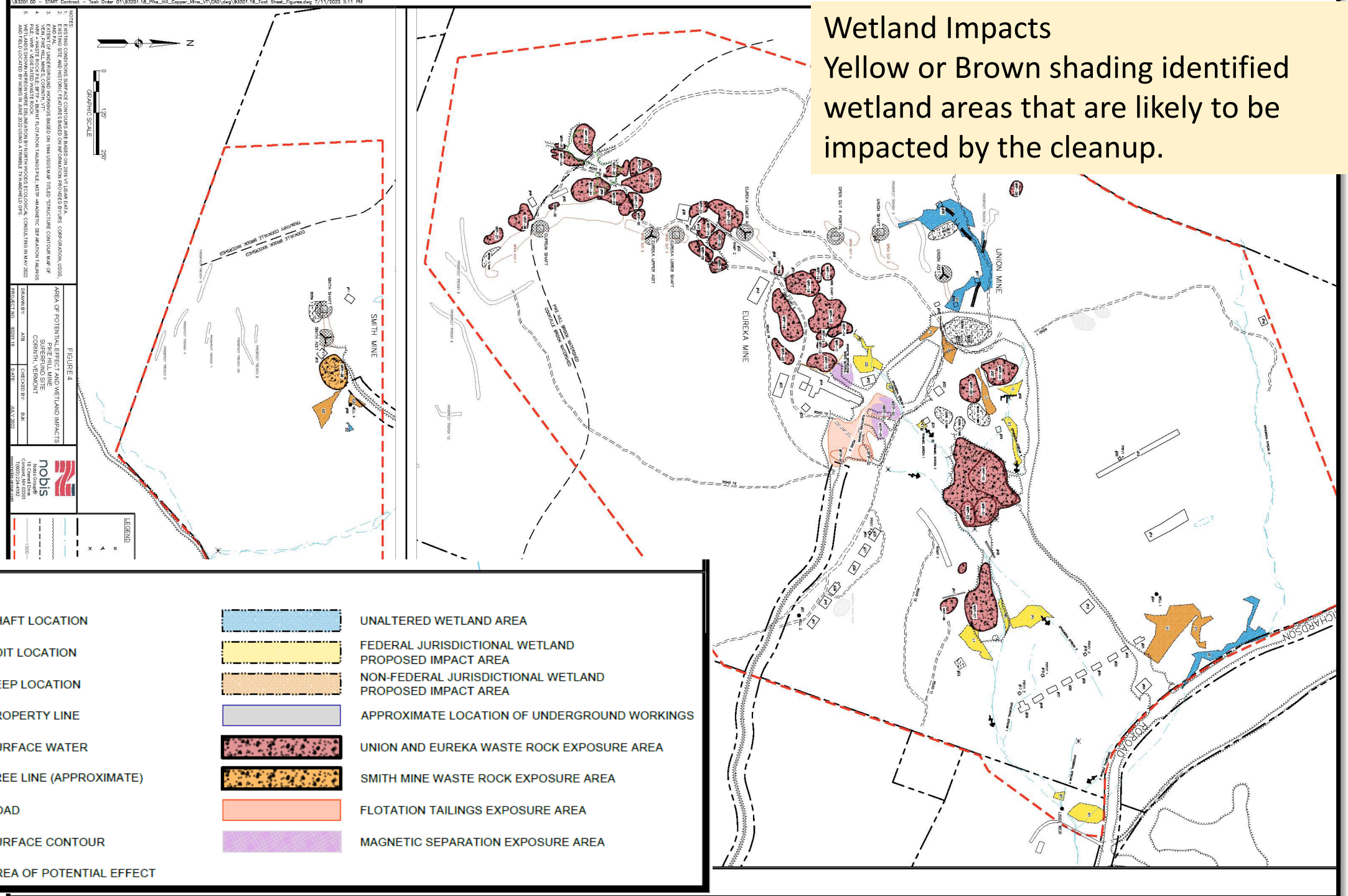


Example of waste rock excavation

Example Cover System Installation

Before and After Waste Pile Removal at a mine site

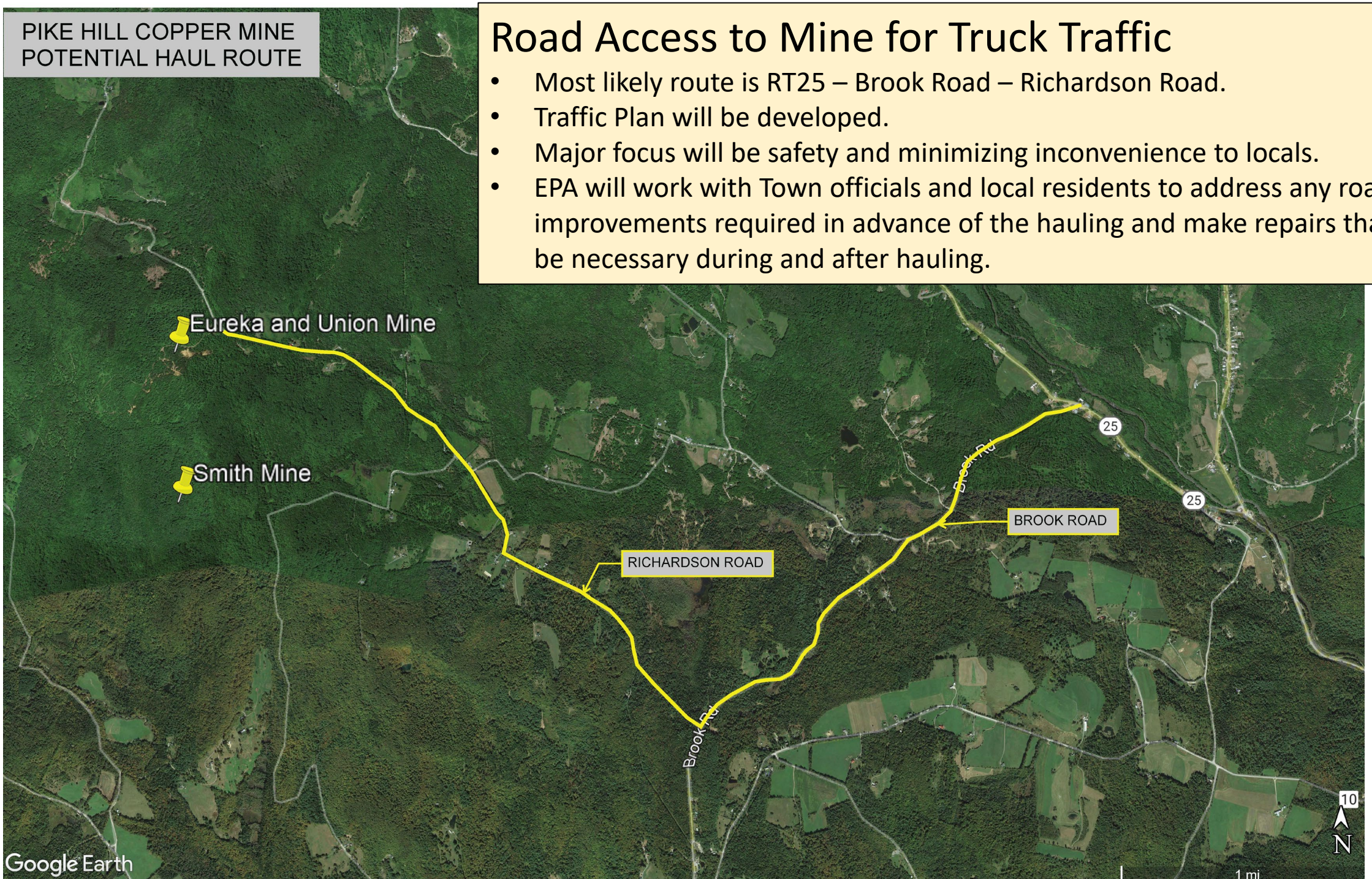
Wetland Impacts
Yellow or Brown shading identified wetland areas that are likely to be impacted by the cleanup.



PIKE HILL COPPER MINE
POTENTIAL HAUL ROUTE

Road Access to Mine for Truck Traffic

- Most likely route is RT25 – Brook Road – Richardson Road.
- Traffic Plan will be developed.
- Major focus will be safety and minimizing inconvenience to locals.
- EPA will work with Town officials and local residents to address any road improvements required in advance of the hauling and make repairs that may be necessary during and after hauling.



EE/CA Criteria Evaluation – Effectiveness and Cost

Alternative 1: Excavation and on-site consolidation/capping of mine waste with in-situ stabilization of select areas of mine waste.

- Achieve Removal Action Objectives:
  - Isolates the mine waste from water and oxygen to prevent the release of MIW.
  - Reduce impacts to Pike Hill Brook and a tributary of Cookville Brook.
  - Improves habitat for endangered species.
- Achieve federal and state regulations (ARARs).
- Less short-term impacts to community from truck hauling (5,000 truck loads).
- $18 million.

Alternative 2: Excavation and off-site disposal of mine waste with in-situ stabilization of select areas of mine waste.

- Achieve Removal Action Objectives
  - Isolates the mine waste from water and oxygen to prevent the release of MIW.
  - Reduce impacts to Pike Hill Brook and a tributary of Cookville Brook.
  - Improves habitat for endangered species.
- Achieve federal and state regulations (ARARs).
- More short-term impacts to community from truck hauling (6,700 truck loads).
- Less historic resource impacts.
- $28 million.

EE/CA Criteria Evaluation - Implementability

Alternative 1: Excavation and on-site consolidation/capping of mine waste with in-situ stabilization of select areas of mine waste.

- Greater implementability:
  - Containment cell standard for mine waste (Elizabeth Mine, Ely Mine, Callahan Mine).
  - Less off-site transportation.
  - Schedule may be extended due to endangered species protections.

Alternative 2: Excavation and off-site disposal of mine waste with in-situ stabilization of select areas of mine waste.

- Less implementability:
  - Available capacity at a disposal facility (non-haz) and distance to a facility would be a major uncertainty.
  - Additional truck traffic increases potential community concerns.
  - Schedule may be extended due to endangered species protections.

Pike Hill Copper Mine Superfund Site – Recommended Cleanup Alternative

- Why does EPA recommend implementing Alternative 1?

  - The Site represents a severe ongoing ecological threat as documented by multiple lines of evidence (surface water concentrations, benthic community studies, fish community studies, and toxicity testing).

  - The proposed Alternative 1 cleanup action would:
    - Greatly reduce acute impacts to aquatic organisms;
    - Reduce contaminant loading to downstream wetlands area;
    - Be the Least Environmentally Damaging Practicable Alternative to protect wetland and aquatic resources (as required under the federal Clean Water Act), and
    - Advance the source control cleanup while EPA continues the investigations to determine whether additional cleanup actions are needed for the groundwater, underground workings, stream sediments, or downstream waters (wetlands and streams) are being completed.

  - Alternative 1 was determined to be the most cost-effective cleanup approach to achieve the Removal Action Objectives.

  - A similar cleanup approach was successful at Elizabeth Mine and has been designed for the Ely Copper Mine.

Pike Hill Copper Mine Superfund Site – Next Steps

- Public Comment:
  - 30-day public comment period for the EE/CA, fact sheet and administrative record will begin August 3, 2022 and extend to September 2, 2022.
  - A public hearing will be held August 23, 2022.
  - You can provide comments at the hearing or email/mail comments to EPA prior to the end of the comment period.
    - Email: hathaway.ed@epa.gov or
    - mail: Edward Hathaway, Project Manager, USEPA Region 1, 5 Post Office Square, Suite 100, Mailcode: 07-1, Boston, MA 02109
  - After EPA reviews and considers all of the comments received, an Action Memorandum will be developed to document the cleanup approach, which will include EPA's written responses to all of the substantive comments received.
- Following the Action Memorandum, EPA would develop a detailed design for the cleanup. The design phase could require 1-2 years. The actual cleanup work may not begin until 2024/2025 or later.

Pike Hill Copper Mine Superfund Site – Next Steps

Other Activities:

- Maintenance and inspections of the engineered cover system and other components of the NTCRA will be performed by the State of Vermont as Post-Removal Site Control.
  - The estimated annual cost is $41,000/year.
  - The Post-Removal Site Control will be included in the Site-wide long-term monitoring, maintenance, and inspections once a final remedial action is selected for the Site.
- EPA will also continue the investigations to assess other areas of the Site, including: Underground Workings, groundwater, stream sediments, and downstream wetland areas.
- EPA will select a final remedy for the site to address any remaining contamination issues not addressed by this NTCRA.

Pike Hill Mine Superfund Site- Site Contact Information

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